3/23/01-3044

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March 23, 2001

Commander
Atlantic Division
Naval Facilities Engineering Command
1510 Gilbert Street (Building N-26)
Norfolk, Virginia 23511-2699

Attn: Mr. Kirk Stevens
Code EV23

Re: Contract N62470-95-D-4814
Navy CLEAN, District III
Contract Task Order (CTO) 0344
Groundwater Sampling Results, Site 90
Operable Unit (OU) No. 17
MCB Camp Lejeune, North Carolina

Dear Mr. Stevens:

This letter summarizes the additional sampling conducted at Site 90 during July 2000. During the Supplemental Groundwater Investigation, groundwater samples 90MW0499D and 90MW0499DDUP collected from monitoring well IR90-MW04 contained trichloroethene (TCE) at concentrations of 2J µg/L and 3J µg/L, respectively. The concentration detected in sample 90MW0499DDUP exceeded the North Carolina Department of Environment and Natural Resources Water Quality Standard (NCWQS) of 2.8 µg/L and both samples exceeded the USEPA Region III Risk Based Concentration (RBC) for groundwater of 1.6 µg/L. Based on these exceedances, it was concluded that additional temporary monitoring wells be installed and sampled in the vicinity of monitoring well IR90-MW04 to delineate contamination downgradient of the well.

FIELD INVESTIGATION

Three temporary monitoring wells were installed in the vicinity of monitoring well IR90-MW04 on July 18, 2000. One of the wells (TP-03) was installed between monitoring well IR90-MW04 and Building BB16. The other two wells (TP-01 and TP-02) were installed downgradient from monitoring well IR90-MW04 (see Figure 1). The wells were installed using a drill rig owned and operated by Parratt-Wolff, Inc. located in Raleigh, North Carolina. The wells were installed using 2-¼ inch, inside diameter (ID), hollow stem augers to a depth of 16 feet below ground surface (bgs). The wells were constructed using one-inch ID, schedule 40 polyvinyl chloride (PVC) screen and riser. The screen length was ten feet and intersected the water table. Sand was used to fill the annulus between the screen and the borehole wall and bentonite pellets were placed on top of the sand and used to inhibit any rainwater or fluids from entering the borehole prior to sample collection. The wells were purged and sampled on July 19, 2000. Table 1 summarizes groundwater quality measurements recorded during purging activities.

Groundwater samples were collected using low-flow purging and sampling techniques. These techniques promote a reduction in sediment within the samples, thus reducing the potential for artificially elevated concentrations of contaminants in the samples. Contaminant concentrations can be artificially elevated if contaminants that normally would remain adhered to sediment particles are leached from the sediment by acid preservatives. A peristaltic pump and dedicated tubing for each well was employed for the purging and sampling activities. Three well volumes were purged from each temporary well prior to sampling.

Following sample collection, the wells were abandoned. Abandonment involved removing the PVC screen and riser, and backfilling the borehole with bentonite pellets to the ground surface. The PVC screen and riser were cut into short lengths and disposed of as non-hazardous material. The bentonite pellets were hydrated thus inhibiting surface water or materials from entering the borehole.

Samples submitted for laboratory analysis were uniquely identified. All samples were designated with the prefix 'SITE90' indicating the site from which the samples originated. The prefix was followed a unique set of characters indicating which monitoring well the sample had originated (i.e., TP01 for temporary piezometer number 1). A single trip blank was submitted for Quality Assurance and Quality Control (QA/QC). The trip blank sample was designated SITE90TB01. All groundwater samples were analyzed for Target Compound List (TCL) Volatile Organic Compounds (VOCs).

All samples were preserved as required and stored on ice at 4° Celsius (C) until final packaging for delivery to the laboratory. Information such as sample number, date and time of sample collection, and requested analytical parameters were documented on chain-of-custody forms. Samples were packed inside large coolers with ample cushioning materials and ice to maintain 4° C during transport to the contracted laboratory. Sealed coolers containing chain-of-custody forms were sent overnight by Federal Express to CompuChem Environmental (CompuChem) in Cary, North Carolina.

RESULTS

A total of three groundwater samples were collected from the temporary monitoring wells (i.e., one sample per well). The analytical results for these samples as well as the trip blank are summarized in the following paragraphs and on Table 2.

Methylene chloride was detected in each of the three groundwater samples and the trip blank sample submitted for analysis. Samples SITE90TP02, SITE90TP03, and SITE90-TB01 all reportedly contained methylene chloride at a concentration of 2J µg/L. The "J" qualifier indicates that the result was an estimated result. Sample SITE90TP01 contained 1J µg/L of methylene chloride. This compound is a common laboratory contaminant and is likely related to laboratory procedures and not the site.

Acetone is another common laboratory contaminant that was detected in groundwater samples SITE90TP01 (5J µg/L) and SITE90TP02 (6J µg/L). This compound is not likely to be site-related but, like methylene chloride, related to laboratory procedures.

The only other compound detected in the samples was xylene. It was detected in groundwater sample SITE90TP01 at a concentration of 2J µg/L. This compound is likely site-related, but was not detected at concentrations exceeding NCWQS for xylene (530 µg/L).

In summary, no TCE was detected in any of the samples collected from the temporary monitoring wells. Therefore, it is assumed that the detection of TCE in monitoring well IR90-MW04 may be the result of an isolated or small scale release from Building 16. There is no evidence to suggest that the TCE detected in monitoring well IR90-MW04 is part of a larger plume migrating off-site. We suggest that this monitoring well be included in the long-term monitoring program planned for Site 90.

As always, we are pleased to assist LANTDIV in this important project. If you have any questions please contact me at (412) 269-2098 (email: jculp@mbakercorp.com), or Ellen Bjerklie Hanna at (412) 269-6117 (email: ebhanna@mbakercorp.com).

Sincerely,

BAKER ENVIRONMENTAL, INC.

James S. Culp

James S. Culp, P.G.
Project Manager

JSC/lp

cc: Mr. Rick Raines, MCB Camp Lejeune (w/attachments)
Ms. Lee Anne Rapp, P.E., LANTDIV, Code EV31 (w/o attachments)
Mr. Dave Lown, NC DENR – Superfund Section (w/attachments)
Ms. Gena Townsend, USEPA (Region IV (w/attachments)
Ms. Diane Rossi, NC DENR-WRO (w/attachments)
Mr. Charlie Stehman, NC DENR-WRO (w/attachments)

TABLE 1

SUMMARY OF FIELD PARAMETERS
FOR GROUNDWATER SAMPLING
OPERABLE UNIT NO. 17 (SITE 90)
MCB CAMP LEJEUNE, NORTH CAROLINA
FOCUSED REMEDIAL INVESTIGATION
CTO-0344

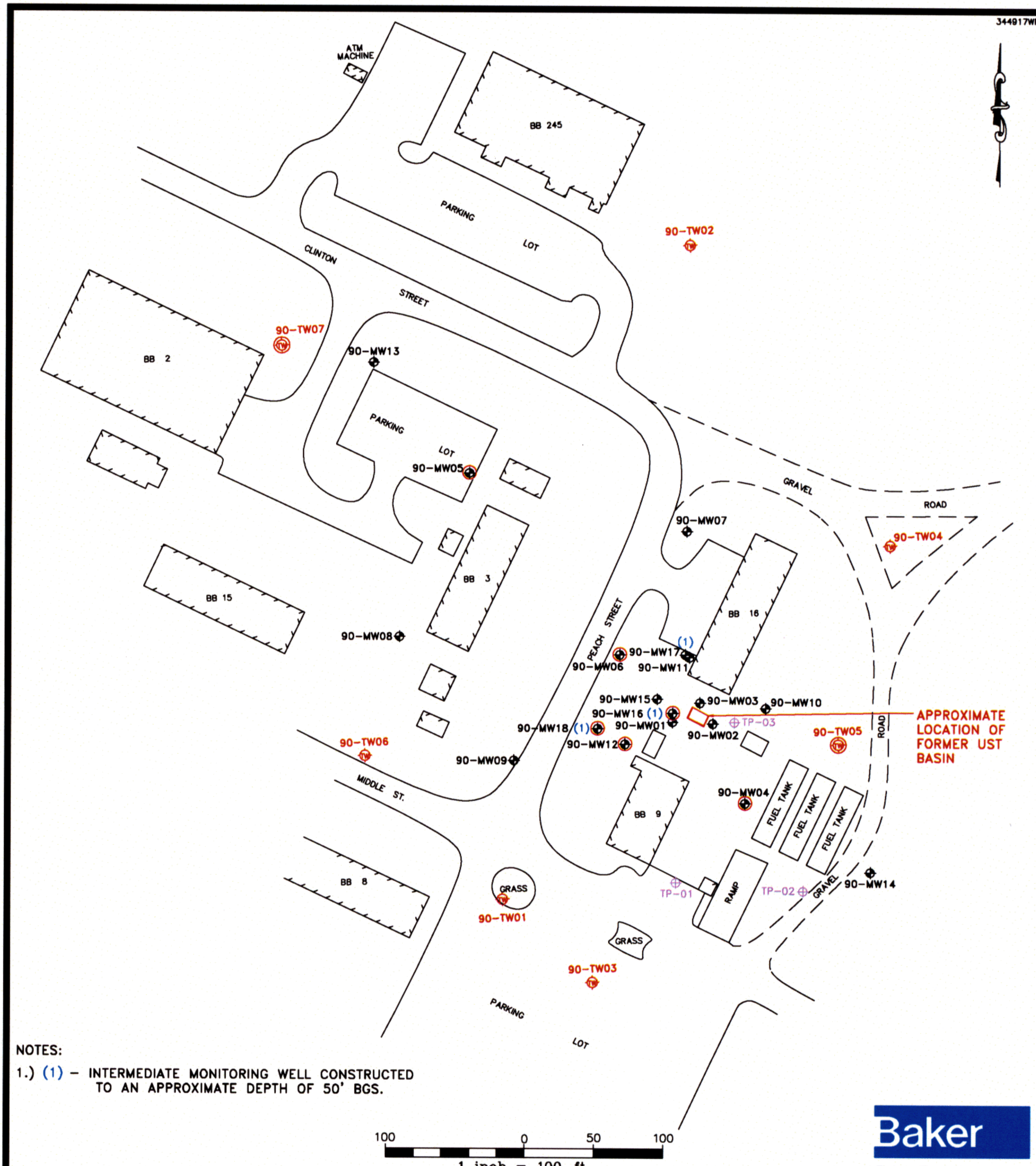
Well Number / Date of Measurement	Measuring Time	Well Volume	Purge Volume (gals.)	Field Parameters: Specific Conductance at 25°C (μmhos/cm)	Temperature at 25°C (°C)	pH (S.U.)	Turbidity (N.T.U.)
TP-01 07/18/00	0943	1	1.95	437	25.1	7.10	89
	0947	2	3.90	435	25.2	7.00	31
	0951	3	5.85	432	25.4	7.00	12
	0954	4	7.80	***432***	***25.6***	***6.97***	***6***
TP-02 07/18/00	0945	1	0.73	1850	23.1	6.81	182
	0949	2	1.46	1800	22.8	6.65	71
	0953	3	2.19	***1800***	***23.0***	***6.65***	***70***
TP-03 07/18/00	1047	1	2.16	945	25.5	6.65	332
	1054	2	4.32	939	24.5	6.45	101
	1059	3	6.48	940	24.2	6.40	69
	1104	4	8.64	949	24.3	6.36	41
	1109	5	10.8	***943***	***24.1***	***6.38***	***54***

Notes:

°C = Degrees Centigrade
S.U. = Standard Units
μmhos/cm = Micro ohms per Centimeter
N.T.U. = Neophelometric Turbidity Units
Bold and italicized readings were recorded immediately prior to sample collection.

TABLE 2
SITE 90 ANALYTICAL RESULTS
OPERABLE UNIT NO. 17, CTO-0344
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SITE 90-TP01	SITE 90-TP02	SITE 90-TP03	SITE 90-TB01
SAMPLE DATE	07-19-2000	07-19-2000	07-19-2000	07-19-2000
VOLATILES (mg/kg)				
1,1,1-Trichloroethane	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U
1,1-Dichloroethane	5 U	5 U	5 U	5 U
1,1-Dichloroethene	5 U	5 U	5 U	5 U
1,2,4-Trichlorobenzene	5 U	5 U	5 U	5 U
1,2-Dibromo-3-chloropropane (DBCP)	5 U	5 U	5 U	5 U
1,2-Dibromoethane (Ethylene dibromide)	5 U	5 U	5 U	5 U
1,2-Dichlorobenzene	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U	5 U
1,3-Dichlorobenzene	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene	5 U	5 U	5 U	5 U
2-Butanone	13 U	13 U	13 U	13 U
2-Hexanone	13 U	13 U	13 U	13 U
4-Methyl-2-pentanone	13 U	13 U	13 U	13 U
Acetone	5 J	6 J	13 U	13 U
Benzene	5 U	5 U	5 U	5 U
Bromodichloromethane	5 U	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U	5 U
Bromomethane	5 U	5 U	5 U	5 U
Cyclohexane	5 U	5 U	5 U	5 U
Carbon disulfide	5 U	5 U	5 U	5 U
Carbon tetrachloride	5 U	5 U	5 U	5 U
Chlorobenzene	5 U	5 U	5 U	5 U
Chloroethane	5 U	5 U	5 U	5 U
Chloroform	5 U	5 U	5 U	5 U
Chloromethane	5 U	5 U	5 U	5 U
Cis-1,2-Dichloroethene	5 U	5 U	5 U	5 U
Cis-1,3-Dichloropropene	5 U	5 U	5 U	5 U
Dibromochloromethane	5 U	5 U	5 U	5 U
Dichlorodifluoromethane	5 U	5 U	5 U	5 U
Ethylbenzene	5 U	5 U	5 U	5 U
Isopropylbenzene	5 U	5 U	5 U	5 U
Methyl Acetate	5 U	5 U	5 U	5 U
Methylcyclohexane	5 U	5 U	5 U	5 U
Methyl-tert-butyl ether	5 U	5 U	5 U	5 U
Methylene chloride	1 J	2 J	2 J	2 J
Styrene	5 U	5 U	5 U	5 U
Tetrachloroethene	5 U	5 U	5 U	5 U
Toluene	5 U	5 U	5 U	5 U
Trans-1,2-Dichloroethene	5 U	5 U	5 U	5 U
Trans-1,3-Dichloropropene	5 U	5 U	5 U	5 U
Trichloroethene	5 U	5 U	5 U	5 U
Trichlorofluoromethane	5 U	5 U	5 U	5 U
Vinyl chloride	5 U	5 U	5 U	5 U
Xylenes (Total)	2 J	5 U	5 U	5 U



NOTES:

1.) (1) – INTERMEDIATE MONITORING WELL CONSTRUCTED TO AN APPROXIMATE DEPTH OF 50' BGS.

Baker

Baker Environmental, Inc.

LEGEND

BB 15	– BUILDING
	– EDGE OF GRAVEL ROAD
90-TW02	– TEMPORARY WELL INSTALLED BY BAKER. SAMPLES ANALYZED ONLY BY ON-SITE LAB.
90-TW05	– TEMPORARY WELL INSTALLED BY BAKER. SAMPLES ANALZYED BY ON-SITE AND FIXED-BASE LAB.
90-MW02	– EXISTING PERMANENT MONITORING WELL. SAMPLES ANALYZED ONLY BY ON-SITE LAB.
90-MW04	– EXISTING PERMANENT MONITORING WELL. SAMPLES ANALYZED BY ON-SITE AND FIXED-BASE LAB.
TP-01	– TEMPORARY MONITORING WELL INSTALLED BY BAKER (07/2000)

FIGURE 1
GROUNDWATER SAMPLE LOCATIONS
OPERABLE UNIT No. 17 (SITE 90)
CTO-0344

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA